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14. ABSTRACT

Information consists of three elements when offensively used within warfare -- surprise, psychological manipulation, and deception. The paper addresses the evolution of the use of information in warfare within the context of operational art. The paper traces the initial discussion and implications by the Prussian theorists before World War I, transitions to the discussion by Soviet Operational Art theorist as they discuss how it is involved within in the deep battle and operational shock concepts, and finishes up with the American discussion of operational art with the Airland Battle Concept. The paper concludes with a discussion on how this impacts current American military doctrine and discusses some changes.

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MASTER OF MILITARY STUDIES

TITLE: Evolution of the Use of Information within the Operational Art:
and its Impact on Modern US Forces

SUBMITTED IN PARTIAL FULFILLMENT
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Executive Summary

Title: Evolution of the Use of Information within the Operational Art: Impact on Modern US Forces

Author: Major Matthew Schroer, United States Marine Corps

Thesis: The elements of information-- that is surprise, psychological manipulation, and deception-- have been an important part of operational art theory and specifically the concepts of "deep battle" and "operational shock," despite the fact that its contribution has not received the extensive discussion in the seminal works of operational art that might be expected. The theoretical integration of these elements within American doctrine is important and enhances the elements of combat power available to commanders at the operational level of war.

Discussion: Information as it pertains to warfare is made up three elements: surprise, psychological manipulation, and deception. Warfare has always contained these elements though their impact within military operations is limited due to the tactical nature of warfare before Napoleon, who fought in the style of "mass-national" warfare." With the emergence of Napoleon and "operational art," as "mass-tactical" warfare, these elements took on a new importance and provided the commander a way to project power well outside of his traditional sphere of influence. As military theorists began discussing operational art, their understanding of the combat power of nature took different forms. Before World War I the Germans heavily emphasized the psychological impact of their weapons systems and sought to create a larger psychological impact on enemy troops across the military operation than that from the actual tactical event. Modern weaponry and the discourse within Western militaries regarding the reduced resiliency of the soldier, dominated military discussion as a result of the Russo-Japanese War. The lack of non-kinetic weapons limited the discussion of how to further impact the enemy to simply the psychological impact of modern weapons. This discussion culminated in the Von Schlieffen plan and the events that followed on the Western Front during World War I. As the Soviets developed a theoretical basis for operation art they began to understand the cognitive nature of the battlefield. The Soviet theorists' understanding of the cognitive nature of warfare led to the development of the "deep battle" and "operational shock" concepts that relied heavily upon presenting the enemy with a multi-dimensional threat created through surprise and deception. Stalin's purges slowed the manifestation of the concepts but they materialized brilliantly during the defense of Moscow as well as the Soviet counter-offensive in 1944. Following World War II, the discourse of the elements of information ebbed and flowed along with operational art but were both reinvigorated following the death of Khrushchev into a second operational art renaissance until the Soviet collapse. As the Soviets approached their second operational art renaissance the Americans adopted the concepts and harnessed the thinking of John Boyd to integrate information at a more effective level and to a greater degree. The American integration culminated with the Airland Battle concept of 1986 and manifested itself during Desert Storm and Desert Shield. The current American Military is at a current crossroads as it continues with its concept development. American doctrine can become increasingly descriptive as to how information is integrated within operational art and lose the power of the conceptual development or it can continue to allow for conceptual thought that will allow for the timeless integration into military operations.

Conclusion: The modern American military is at a potential crossroads as it emerges from the conflicts from 2001-2012. It is in the process of developing doctrine that is overly descriptive on how information relates to specific operations. The military can continue along this path or return to its period of operational art renaissance and maintain a theoretical relationship between operational art theory and the elements of information.

DISCLAIMER

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Preface

The research contained within the paper is largely derived from translated primary and secondary sources from the respective country's military histories. The research is intended to highlight how the use of information was addressed as the theory of operational art developed and evolved from early German thought through the Soviets to the modern American discourse. The research then attempts to determine how that evolution affects modern American doctrine and determine if something is lacking in the content of American doctrine.

The research was inspired by Lieutenant General Paul Van Riper, USMC and his lectures at the Command and Staff College. Lieutenant General Van Riper is an inspiration and master of theory and new ideas; I hope that I can remain that open minded and involved thoughout my lifetime. Direction was provided by Mr. John Schmitt, Dr. Bradford Wineman, and Lieutenant General Paul Van Riper along with Colonel Christopher Naler, USMC. The final drive to completion was enabled by Dr. Gordon and his essential assistance until the paper was complete.

I owe a great debt of gratitude to a great friend who taught me how to appreciate information: JT. Thank you for your mentorship and remember: "De inimico non loquaris sed cogites."

Finally, to my wife Krista and my children Patrick, Molly, Maggie, Caroline and the next two, who were a critical part of this effort. Without their love and support none of this was possible. Krista is the most selfless person I know and gives all to her family every day. Thank you and I love you!

"I believe what will reveal itself as we understand operational art is that information is the third element of combat power. Not computer network operations but the fundamental elements of deception and psychological operations."[1]
- Lieutenant General Paul Van Riper, USMC (Ret)

The effective integration of information; consisting of the elements of surprise, psychological manipulation, and deception; within military operations can potentially change the course of a campaign and a war. The development of the operational level of war and operational art; effectively translating strategy to military tactics within the context of larger military movements; has magnified the power of information to the point that a military commander can influence events outside of his physical reach, modifying adversary plans, disrupting adversary movement, and influencing adversary soldiers not to seek battle. The power of the elements of information developed alongside and within the theory of operational art as the early Germans discussed the psychological impact of battle and how to harness its effects, the Soviets discussed the integration within deep battle and operational shock, and the Americans integrated all the elements within the Airland Battle doctrine. The modern American military is at a doctrinal crossroads; over the course of the wars in Iraq and Afghanistan doctrine has become increasingly reductionist and describes specific characteristics of operations and less the conceptual application of key concepts, devolving from the purpose of doctrine to provide a "military organization a common philosophy, a common language, and a common purpose."[2]

The employment of information in innovative ways derived from its theoretical operational art underpinnings is the most powerful method of integration within doctrine. The increasingly descriptive nature of doctrine undermines the effective integration of information as it prescribes ways to integrate information within specific types of operations. As American military doctrine evolves following an extended period of war, the concept of information as an

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element of combat power potentially provides a significant advantage in the future for military practitioners. Conversely and dangerously doctrine may continue down a reductionist path that leads to a misapplication of information and reduced efficacy. This paper posits that despite the fact that the seminal works of operational have not discussed information extensively, its importance is hidden within the roots of early operational art discussion by the Germans before World War I, concepts developed and applied by the Soviets from World War II until the collapse of the Soviet Union, and doctrinally integrated in Airland Battle by the American as a result of the work by John Boyd. The power within all operational art discourse was the conceptual integration of information throughout concepts as opposed to rigid prescription of its application within doctrine. This paper concludes further that the United States is at a doctrinal crossroads and can potentially destroy the effectiveness of information in military operations by rigidly prescribing its exact application or allow practitioners to harness its conceptual application and apply information in a relevant manner in novel ways to a unique environment.

Beginning with Carl von Clausewitz's book On *War* and the development of the layer between strategy and tactics referred to as the "operational level of war", military theorists' understanding of activities that take place in this context has evolved from the Germans, through the Soviets, and to the Americans, and military activities often reflect this understanding in campaigns. Along with the elevation of military operations and it's theory, an embedded understanding developed about the relevance of the use of information within operational level activities. Information in the military context is not just elements of data that allow a commander to understand the battlefield and control his forces but is also an element of combat power. Current American doctrine defines combat power as "the total means of destructive and/or disruptive force which a military unit/formation can apply against the opponent at a given

time."[3] Information manifests itself in combat power through three primary terms that are increasingly complex in their application: surprise, influence, and deception. Prior to the development of the operational level of war and operational art, information as a weapon was of minimal importance to military commanders, not least because of a lack of technology by which to project that information.   Information was tactical and could include troop level controls that allowed a commander to surprise an enemy or cause an action based on the enemy commander's observation of troop movements. Information was time sensitive, and the commander could not shape the information environment other than in the present. Other than the tactical level, information was the domain of the statesman, and only the leaders of nations could use information to provide significant effects in a conflict. Within the context of modern operational art, the effective use of information can enhance a campaign and provide the military commander with an asymmetric weapon that greatly extends his area of influence by extending his reach and endurance.

As the significance of the elements of information increased, discourse within the seminal works of operational art did not always fully reflect the element's relative importance clearly. Significant periods operational art discourse hide the importance of information within concepts and later application of the concepts reveal information's importance. The integration of information along with the practice of operational art demonstrates that information continues to be a critical element of combat power in the modern American military. Information can provide operational commanders an asymmetric weapon that can develop the battlespace before conventional forces are involved, magnify and enhance the combat power of forces once they are involved, and present the adversary with a threat in multi-dimensions that brings the concepts of "deep battle" and "operational shock" to fruition.

Operational Art

Operational art is a relatively new phenomenon in military theory, tying its origins to military geniuses such as Napoleon Bonaparte and innovative command and control methodologies like the Corps D'Armee or later to tools like the tactical radio. The field continues to evolve as the methods and tools to command and control larger forces grow more capable.[4] Although operational art was intuitive for geniuses such as Napoleon, military theorists since Napoleon have grappled with its principals and application in order to gain a better understanding and provide further intellectual rigor to the concept. Though many European countries with established armed forces and martial traditions could provide the intellectual capital for further development, the preponderance of operational art thought originates from Germany during the Second Reich and the Soviet Union between its founding in 1917 and until its demise in 1991.[5] Based on the prevalence of thought, it is useful to focus on the German and Soviet traditions to examine their thoughts on the relationship of operational art with information.

The Elements of Information

"The backbone of surprise is fusing speed with secrecy."[6]
– Carl Von Clausewitz

Though current American doctrine identifies the use of information in an offensive manner as information operations, information operations is simply a recent development that acknowledges the interrelationship of the three elements of information and captures them within a single expression.[7] Historically, it is more useful to identify the offensive use of information in the three elements typically referenced in historical writing: surprise, psychological operations or manipulation, and deception. These terms more accurately capture the effects that the

commander is attempting to achieve instead of modern American doctrinal terminology that changes depending upon the political climate. The change in the terminology of psychological operations to military information support operations is an example of this.[8]

The three elements represent the primary ways military forces attempt to use information offensively in modern war in order to affect an adversary. Surprise represents the control of one's own information and signatures or emissions thereby denying the information to one's adversary. Though surprise is perhaps the oldest of the elements and the most simply employed, it is often the most difficult to describe. The widely accepted mathematical Beysian Theory of Surprise describes the phenomenon in a scenario where an observer, or an adversary, expects to see one event based on his previous experience.[9] The Beysian Theory of Surprise mathematically describes the fact that surprise is a function of unexpected conflicting information, where a person develops an expectation of a situation based upon previous experiences and mental models. The Beysian Theory describes a situation where a subject expects his senses to cognitively understand a certain situation; the senses actually provide conflicting information that creates the condition of surprise. This description is not unique to the Beysian Theory but mathematically proves the phenomenon and allows for the calculation of the phenomenon as well as further exploration within information theory.[10] Therefore, in warfare, surprise is the creation of an unexpected condition manifested through the control of signatures that provide adversary sensors the ability to accurately predict the future events. This control of information or signatures allows one to "surprise" the observer or the adversary with an unexpected action or series of actions. These actions then provide a commander an advantage due to a lack of preparedness by the opponent for the given action.

Though surprise is firmly rooted in a military tradition, psychological manipulation is more akin to modern marketing. Current American military doctrine refers to this as military information support operations or MISO and defines it as "Planned operations to convey selected information to influence their [adversaries] emotions, motives, or objective reasoning, and ultimately the behavior of foreign governments, organizations, groups, and individuals in a manner favorable to the originator's objectives."[11] In the case of modern marketing, an originator of a product intends to change a target audience's behavior by first creating a cognitive acceptance of an action or thought. The originator then attempts to cause the subject to act upon that behavior by purchasing an item or creating some other desired behavior.[12] The originator effects this behavior by conveying select information to the target audience through a variety of mediums that the target likely trusts as credible while leveraging the target's beliefs to his advantage.[13]

In a military context, psychological manipulation through means other than physically killing enemy combatants is relatively new, and some sources date it as late as World War I with the delivery of aerial leaflets.[14] Though the development of this element within warfare is recent, it has gained importance with the increasing reach and tempo of modern information that allows a commander to project information towards enemy soldiers or civilians and create an operational advantage. The advantage results in effects from minimizing the interference of civilians in military operations to demoralizing enemy soldiers and attempting to reduce combat efficiency or create defections.

Deception is the most seemingly intuitive element to human beings, but the purpose of a deception is often lost within its finer intricacies. Deception has been an integral part of military thinking as it written about by some of the earliest military authors. Sun Tzu states, "All warfare

is based on deception…pretend inferiority and encourage arrogance."[15] He further integrates deception and surprise urging commanders to "alarm him to the front, *surprise* him to the rear, create an uproar to the east and strike in the west."[16] Based on his writing and others the importance of deception is clear, but the question remains how to deceive and to what effect. The answer to both is more complex than for surprise and influence. In the case of deception, the deceiver seeks to deny certain aspects of information while providing others to a specific decision maker. The purpose is to cause the decision maker to take a specific action beneficial to the deceiver.[17] American doctrine defines military deception as "Actions executed to deliberately mislead adversary military, paramilitary, or violent extremist organization decision makers, thereby causing the adversary to take specific actions (or inactions) that will contribute to the accomplishment of the friendly mission."[18] These characteristics make deception the most powerful of the elements but also the most complex. The complexity lies in the requirement to fully understand the target cognitively, understand how the target gathers and processes information, and then decide how to affect the means in which the target collects information.

Whether taken as the elements of information or as a whole, the control of information offers a commander the possibility of gaining a significant advantage on the battlefield or within a campaign. The problem is that the control of information within a military campaign creates an interactively complex wicked problem that is ill suited for doctrinally prescriptive solution. It is the responsibility of the commander, to apply analytical rigor to the problem, considering aspects of the problem that are unique to their situation and seeking understanding a theoretical understanding of information within operational art. Understanding how and when to apply information requires an examination of how the theory of operational art addresses the

application of information, from the least complicated element of surprise to the most complex element of deception.

Information within Operational Art

"We see, therefore, that wars is not merely an act of policy but a true political instrument, a continuation of political intercourse, carried on with other means."[19]
-Carl von Clausewtiz

 Since its inception from the Soviet theorists in the 1920s, operational art has developed thematically based on the perceived characteristics of warfare. Though the derivation of the theory of operational art is rightfully credited to the Soviets, significant useful academic discussion took place in the German military circles following Clausewitz and up to World War I. Though operational art theory stagnated during the purge of the Soviet Officer Corps in 1937, the catalyst of the German invasion in 1941 allowed Soviet operational art to flourish through the later period of World War II. In the post World War II era, the importance of operational art shifted along with the perceived characteristics of warfare. The shift encompassed a minimization of the importance of operational art in favor of nuclear warfare to a virtual renaissance during the 1970s and 1980s across most of the major military powers, which included its adoption by the United States Army and Marine Corps in the 1980s. Throughout the ebb and flow, the relevance of information as an element of operational art has persisted to some degree as reflected in both the writings of military theorists as well as the use of the elements of information within a military campaign actively practicing operational art.

German Discussion

"The enemy bombards our front not only with a drumfire of artillery, but also with a drumfire of printed paper. Besides bombs which kill the body, his airmen also throw down leaflets which are intended to kill the soul."[20]
-Field Marshal Paul von Hindenburg 1847–1934

German military thought after Clausewitz laid the foundation to broaden the theories on warfare thereby making the operational level of war plausible. As the operational level of war gained credibility, so did the offensive use of information by military practitioners above the tactical level of war. Though it was not realized at the time, most military thinkers from the 1820s to the 1870s thought of war in the Napoleonic paradigm, what would be referred to today as a closed system. A closed system is a phenomenon where two or more bodies interact without any input from external bodies or systems, which limits the scope and eliminates unknown variables within the system.[21] A closed system limits the influence of the battle and commanders to the adversary in his immediate proximity, something increasingly less likely. German thinkers from the 1870s to World War I such as Alfred Graf Schlieffen, Fritz Heonig, Baron Colmar von der Goltz, and Friedrich von Bernhardi began breaking from the Napoleonic paradigm and understood its broader interaction with external phenomenon thus acknowledging warfare as an open system subject to information from sources external to their immediate understanding and perhaps even external to the campaign.[22]

As German military thinkers sought to comprehend larger systems of battle, the discussion of information took two paths: discussion of surprise and moral factors of which moral factors is affected through psychological manipulation. These elements were orthogonal manifestations in German schools of thought. Since moral factors impacted upon the actions of the individual soldier and unit, it was thought that this was something a military commander could impact by enhancing the psychological resiliency of his unit or by the careful use of weapons that had a inordinate impact upon the adversary's moral resiliency. Conversely, German military thinkers deemed the element of surprise below the strategic level of war largely irrelevant due to the increasing accuracy and speed of information.[23] It was thought that the

speed of information defeated surprise by making situational awareness ubiquitous and thus surprise impossible. Though they understood the psychological impact of warfare, German thinkers misunderstood the human factors of decision-making and Clausewitz's element of friction.

Although the German military did not believe that they could effectively deceive an adversary below the strategic level of war, schools of thought on troop employment developed that directly impacted the ability to surprise an adversary. The success and admiration in Europe that the German army enjoyed from its tactical excellence in combined arms, led to a move to formalize this excellence within the army in the form of two operational theories. The first theory was *Normaltacktic* led by Captain Albrecht von Bogulslawski and Major Wilhelm von Scherff.[24] The success of this tactic was derived from a high level of standardization and control so troops could maneuver safely under the cover of supporting arms in a time where command and control did not exist directly between the infantry units and the supporting arms units.[25] The competing school of thought was *Auftragstaktik* or mission command in modern parlance. Influential thinkers such as Major Verdy du Vernois, the Reich's war minister, argued that these tactics provided greater flexibility to operate in a modern distributed battlefield and were thus more effective.

Given the centralized nature of *Normaltacktic,* it is easier to centrally control the projection of information and thus surprise an adversary. However, *Auftragstaktik* is surprising by its very nature as the actions of the attacking force could be perceived as almost random and chaotic on a non-linear battlefield.[26] Since *Auftragstakti* harnesses the insights of individual commanders across the battlefield, it is unpredictable and thus surprising. *Auftragstaktik* is also designed to allow an army to take advantage of transitory opportunities to destroy enemy units

and have a broader effect than the singular unit action.[27] This doctrine is consistent with an understanding of moral factors or psychological manipulation. It allows an army to create operational shock by surprising an enemy at multiple points across the battlefield through successful small unit actions.

The German theoretical discussion about the elements of information and their importance on the battlefield mirrored the impact of information within the two theories. Thinkers, such as von Schlieffen, interpreted developments like aerial reconnaissance and the increasing speed of information to mean that deception was no longer possible and surprise was unnecessary.[28] Von Schlieffen further theorized that although surprise at the tactical level was difficult, strategic surprise was a reasonable goal because military units were inherently unready.[29] These conclusions led the Germans to dismiss tactical and operational surprise as goals and focus increasingly on the shock effect of their tactics against the individual soldier and the unit. The focus' impact was broad and influenced the German Stormtrooper tactics late in World War I.

Whereas the Germans deemed surprise and deception less important, they focused heavily on the psychological impact of their actions and became somewhat obsessive with its discussion of the psychological impact. In order to create broader effects on the highly linear modern battlefield, the Germans believed that they could impact the moral elements by creating a psychological impact in a discrete area that spread to other areas or units. The problem of the linear battlefield was deemed by von Moltke and others as the "tactical crisis."[30] Whereas modern warfare seeks to create psychological impacts through both physical and cognitive methods, the Germans and others focused on the physical means based on limitations of the technology of the time. The physical impact included discussion on how best to employ the

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machine gun and other modern weapons to affect troops psychologically as well as how to best attack and sequence attacks to create the largest psychological impact. German leaders such as General von Blume and von Moltke the Elder believed that although the battle was fought in the physical dimension with rifles and artillery, it was won in the cognitive dimension by creating a psychological impact across the front of adversary soldiers larger than the single attack.[31]

The German struggle was centered on not just how to psychologically impact a small adversary unit and create a broader affect but also how to mitigate the same from happening to one's own force. This struggle developed based upon the widely held belief that "modern society" had created a state of moral deterioration that made troops more susceptible to the psychological impacts of warfare.[32] Much of the theory was developed from observation of the Russo-Japanese War in 1904 and led to a Germanic wide campaign to re-instill the warrior spirit among their troops and create a higher level of psychological resiliency.[33] What the Germans failed to realize was that the Russian troops in the war had other significant moral weaknesses that impacted their performance to the point where many officers could hardly afford to feed their own families.[34] It is questionable if the Germans derived the correct lessons about their soldier's moral spirit.

Although German thinkers and theorists largely discounted surprise and deception, their thoughts and discussion about the psychological impacts of modern war are important and complement Clausewitz's discussion about the moral elements of warfare.[35] More specifically they understood the impact of the fog of war upon the common soldier and sought a way to broaden the effect. They understood that it is useful to use available capabilities to create a psychological impact that can spread along a broader front against an adversary, which would be

useful for later developments as militaries developed capabilities that could affect adversaries cognitively and not just physically.

Soviet Discussion

"At the same time, a review of the history of the campaign in which he [German corps commander] was fighting shows that, whilst he was winning his tactical victory, the entire field army of which he was apart was being engulfed in a catastrophic operational encirclement on a scale which the German commander could not grasp."[36]
- Christopher Donnelly

As German operational thought declined in the 1930s, operational theory within the Soviet Army gained momentum.[37] Following World War I, the Soviets dominated the development of meaningful theory in operational art until the 1980s. The dominance was led by seminal thinkers such as Aleksandr Svechin and was carried through by Nikolai Varfolomeev and Mikhail Tukhachevsky who crafted groundbreaking concepts such as shock armies and deep battle.[38] The development of operational art theory stagnated following Joseph Stalin's purges of the Soviet officer corps in 1937 but once again gained energy during the period of crisis following the German invasion of the Soviet Union in 1941. Following World War II, the importance of operational art within Soviet strategy ebbed as a result of the elevation of the importance of nuclear warfare under Nikita Khrushchev in 1954 and increased to a period of virtual renaissance in the 1970s as Soviet thinkers and politicians understood and dealt with the generation of limited warfare.

From the inception of Soviet thought on operational art, the Soviets tacit acknowledgement of warfare as a chaotic space gave them an advantage over their adversaries that would allow them to integrate all elements of combat power, to include information, within the concepts of operational art. Though the Germans discussed non-linear tactics within their forces, the Soviets were the earliest military to understand the full implications of an

interactively complex system or today is referred to as systems theory. Systems theory seeks to understand the operational environment through the entirety of its existence as opposed to reducing a system to what one believes are its fundamental elements. Though they did not discuss operational art in the context of systems theory, Soviet operational art concepts such as "deep battle" and "operational shock" reflect an understanding of what is known today as systemic design. This is clear when their early doctrine in the 1930s emphasizes that the study of war takes place within "the range of human activity."[39] The Soviets did not just focus on the actual military events, but also examined the role of government and the people within warfare. The Soviet definition of doctrine further reflects this approach. The consistent Soviet definition of doctrine is "a nation's officially accepted system of scientifically founded views on the nature of modern wars and the use of the armed forces in them, and also the requirements arising from these views regarding the country and its armed forces being made ready for war."[40] Or, more succinctly, the Soviets treat doctrine as an open system that contains other systems and could be affected by external factors because warfare is not a discrete activity. The introduction of the concept of geographically unlimited warfare opens new frontiers for the integration of information. Instead of limiting the utility of information to the battlefield on which the war is fought, military commanders may harness information to affect adversaries well beyond the range of traditional weapons systems. The concept also improves the understanding of a commander about their adversary's decision making process, allowing him to account for relevant variables, and making his plan more viable.

Although the integration of the elements of information is sometimes inconsistent within the theoretical discussions, the practice of warfare at the operational and strategic levels during World War II is very informative as to the importance of surprise and deception within the

Soviets thinking. The quote at the beginning of this section from Soviet historian Christopher

Donnelly best captures the importance of these elements within Soviet operations.[41] This quote

represents the ability of the Soviets to connect operational level warfare with surprise and

deception on a scale that was unimaginable to the German commanders. The German

commanders thought in terms of their immediate battlefield while the Soviets considered the

battlefield in terms of fronts, which gave them a significant edge while surprising and deceiving

the Germans. Despite the fact that the Soviets understood the importance of surprise and

deception at the operational level, they did not address psychological manipulation as a tool until

the 1980s.

Soviet thinkers developed the majority of their theories of operational art following the

disaster of World War I. Though the Russian armies of the time were not engaged in the same

types of warfare as on the Western front, they were suitably educated about the type of attrition

warfare that took place and rejected it as a fitting method to wage warfare. Soviet thinkers were

also intimately familiar with the types of warfare on the Eastern front and those of their own

revolution and saw promise in the way that these wars were waged, with maneuver on a massive

scale and the need for effective successive operations. Thinkers like Tukhachevsky saw this as

an opportunity and developed the concept for "deep operations." His follow on concept for

"operational shock" or "udar" further defined how to conduct deep operations and allowed for

the integration of the elements of information within the Soviet theories.[42]

The concepts of deep operations and operational shock exploited the theory of center of

gravity in a way that the Germans with their Schwerpunkt could not and allowed for the effective

integration of information at the operational level of war.[43] The Soviet concept of deep

operations attempted to create operational shock for the enemy by integrating the elements of

power in both the physical domain and the cognitive domain and thus create a deep, multi-dimensional threat that surprised and disrupted the adversary to the point where they could no longer deal with the opposing forces. The Soviets then unified these two elements to create a third concept of momentum, the concept that ultimately obviated the need for attrition warfare.[44]

In the Soviet concept of "deep battle," the traditional elements of military power dominate the physical domain. Operational level strike and maneuver is conducted by elements such as an armored column or airborne operations. The elements of information, specifically surprise and deception, dominate the cognitive domain. These elements of information create a state of mind within the adversary whereby the adversary perceives that they are weak because of surprise and the adversary unknowingly creates an actual weakness through deception. These two concepts generate momentum reducing the adversary's system of resistance.[45] The integration of information caused adversary's military system to fail due to the multi-dimensional threat, overwhelming the adversary's ability to deal with multiple axes of perceived or real threats. These concepts, nested within Soviet operational art, are powerful and overcome any superiority an adversary might have in a singular warfighting domain.

Stalin's purges of the Soviet officer corps from 1937-1938, which included nearly 90 percent of all generals and 80 percent of all colonels, stagnated operational art theory and led to the return of traditional focus on tactics and German super-tactics such as blitzkrieg.[46] Stalin purged and killed influential thinkers such as Tuckhachevsky and Svechin. The confusion and incompetence that emerged in the officer corps was reflected first in the dismal performance during the Soviet-Finnish War and then during the initial German invasion of the Soviet Union in 1941.[47] The Soviet-Finnish war led to the abandonment of the operational shock concept until later in the war and thus the integration of information within military operations.

The invasion of the Soviet Union by Germany in June 1941 and the ensuing dismal performance of the Soviet Army led to a rekindling of operational art theory later that year. The crisis generated by the war decoupled the tight control over military thinking by Stalin, allowing the true nature of operational art to permeate through Soviet military leadership. Operational art developed along lines that closely resemble the three periods of Soviet-German warfare: strategic defensive, transition, and strategic counter-attack.

The invasion triggered a strategic defensive as the Germans engulfed the Soviets along a massive front. Along with the strategic defensive, Soviet leaders started dealing with the impact of the purges and attempted to comprehend how they could counter the German's tactical superiority. From 1942-1943, the Soviet Union entered a period of strategic transition as its military situation stabilized and defeat at the hands of the Germans no longer seemed imminent. As the Soviets understood the strategic solution to the German threat, they re-implemented deep battle and operational shock theory within the Soviet Army. Finally, from 1944-1945 the Soviets assumed the strategic offensive and fully implemented the theoretical concepts from the schools of operational art thought in the 1930s.[48] These concepts manifested themselves in their counter-offensive, destroying the German Army. Because there is little written about how the Soviets integrated information within these concepts, the following examination of how the Soviets utilized the elements of information during World War II is informative.

The Soviets experienced mixed success with the integration of information, specifically surprise and deception within their operations. Operational deceptions during the strategic defensive at Rostov in 1941, Moscow-Toropets in 1941, and Barvenkovo-Loovaia in 1942were relatively effective while other deceptions fell prey to German intelligence at Khar'kov.[49] Despite the mixed success of these operations, as the Soviets reinvigorated operational art, they

began integrating deception within their units as a matter of unit design. They created and employed tank armies to convey to the Germans the impression of multiple axes of advance and they began to obscure the nature of their forces in order to confuse the Germans.[50] These early concepts sought to minimize German operational maneuver and allow Soviet forces to destroy Panzer units in succession as they defended areas in depth. These concepts also layed the foundation for the later implementation of operational shock in the offensive, allowing the Soviets to realize the deep battle that they sought, disrupting supporting units, disguising the actual composition of Soviet forces, and creating a threat that operational level German commanders could not conceptualize or deal with.

As the Soviets fully reinstituted operational art and its supporting concept, the integration reached its pinnacle during the general offensive by the Soviets in 1944. Though the Soviets destroyed any offensive operational capability of the Germans by 1944, significant German forces remained in the Soviet Union and fought hard. Hitler directed the German forces to "bleed the Soviets white."[51] The Soviet Deputy Chief of the General Staff, General Schtemko, described a Soviet offensive that sequenced and alternated the front of the attack. Because the Germans still capably resisted and defended against local Soviet offensives, the Soviets secretly moved reserve armies along the fronts, creating overwhelming military superiority on a specific front.[52] The rapid movement of the reserves allowed the Soviets to surprise the local German commander while deceiving the German army and causing them to misallocate their forces along the front, further enhancing the Soviet advantage resulting in operational shock.[53] This multi-dimensional dilemma that harnessed surprise and deception, allowed the Soviets to advance swiftly against the capable remnants of the German forces that invaded the Soviet Union and hasten the end of the Third Reich while preserving Soviet combat capability.

Significant turmoil existed within Soviet military intellectual circles in the period following World War II until 1969. Following the detonation of the nuclear weapons over Hiroshima and Nagasaki and the surrender of Japan, Stalin re-imposed his control over military thinking. Stalin exerted further control over Soviet military thinking and operational art concepts by exiling prominent thinkers such as Marshall Georgy Zhukov.[54] With Stalin again in control, the Soviet military derived inappropriate lessons from World War II victories and attempted to "socialize" Soviet military doctrine. This imposition of control led to a stagnation of Soviet operational art concepts and affected the integration of information within the concepts negatively.

Under Stalin's influence, Soviet military thinkers derived principles that they thought reflect the Communist nature of war and the means with which the Soviets defeated the Germans. These simplistic Jominian principles such as mass and speed were overly reductionist and lost the essence of how a tactically inferior Soviet Army was able to counter-attack and defeat a capable German war machine.[55] The Soviets lost the understanding of the complex concepts of "deep battle" and "operational shock," and with them the understanding of the elements of information. Stalin's dominance of military thought and affairs continued until his death in 1953.

During battle for succession of Stalin, two personalities emerged with competing philosophies, Nikita Khrushchev and Georgy Malenkov.[56] Malenkov argued for increased emphasis on the Soviet nuclear forces with reductions in the ground force composition while Khrushchev wanted a continued focus on Soviet conventional forces. Though Khrushchev ultimately won the battle for political power, the coming Soviet military evolution did not ultimately benefit the ground forces or operational art theory. The increased dialogue among

military thinkers ultimately concluded that any war with the United States would begin with a nuclear exchange.[57] This assumption deemphasized the need for operational art and increased the need for capable nuclear forces. Coupled with socio-economic factors imposed by a low birth rate during World War II, Khrushchev cut ground forces and focused on strategic nuclear weapon delivery forces.[58] Along with a dearth of theoretical discussion of the operational level of war and operational art, the principals that tied Soviet operational art to the elements of information were missing during this period, leaving the future for the elements in a precarious position.

The Soviet military evolution had much the same impact on the integration of information as the period following World War II. Though Soviet thinkers were able to discuss formerly shunned concepts such as deep battle and operational shock, their conclusion regarding the inevitability of initial nuclear exchanges focused the expenditure of intellectual capital on the survivability of forces instead of operational elements such as surprise and deception. However, a key difference from the period following World War II was the renewal of Soviet military thought. For the first time since World War II Soviet thinkers began studying key World War II campaigns such as Belorussia, Iassy-Kishinev, Vistula-Odor, and Manchuria that richly integrated surprise and deception.[59] Further, the analyses were not superficial as before but were along the path recommended by Clausewitz and sought a deep theoretical understanding within their historical context. In the end, this thought concluded the need to address an initial nuclear exchange, but it laid the foundation for continued discourse that developed into the renaissance of operational art following Khrushchev's fall from power.

Despite Nikita Khrushchev's loss of power in 1964, a shift in military thinking did not materialize until 1968 due to the momentum under Khrushchev's rule. The shift was further

catalyzed by increased capability among NATO forces and nuclear parity that reduced the likelihood of a nuclear first strike.[60] Though the operational art renaissance emerged late in the existence of the Soviet Union, the integration of information was significant. As the Soviets studied key campaigns from World War II they began integrating information as a key element to effective operational art. The Soviets sought to integrate the elements of surprise and deception in much the same manner as during their peak during World War II but also began discussion about a new concept, psychological manipulation much like the Germans before World War I.[61] The inspiration for the integration is not clear though it is certainly tied to the emergence of irregular warfare during the period following World War II. This period exposed the increasing vulnerability of adversary troops to psychological manipulation through an exposure to information that might impact their behavior. This vulnerability, coupled the means to impact troops through technology from simple radio to more complex means of influence, gave the Soviets the means and the method to integrate psychological manipulation into the concepts of deep battle and operational shock. The introduction of psychological manipulation presented the adversary commander with yet another element of a multi-dimensional problem.

The final period of relevant operational art development within the Soviet Union lasted until its demise. The period reflected a balance between nuclear strike and conventional forces that spawned innovation within Soviet military circles and had a significant impact on the integration of information.   A key catalyst was Colonel-General Andrian Danilevich who proposed that a Warsaw Block and NATO war might in fact become a prolonged exchange due to the nuclear parity that existed.[62] His thoughts validated the fact that the nuclear stalemate created a period where general warfare was unlikely and where limited warfare was now the norm.[63] Soviet operational art focused once again the potential for operational shock and sought

to forward position forces. Theorists such as S. P. Ivanov posited that forward positioned Soviet forces eliminated the effectiveness of the NATO nuclear threat and allowed Soviet forces to capture France in less than five days thus making nuclear exchange unlikely.[64]

Based on extensive examination of key World War II campaigns during the nuclear period, the Soviets already had a fundamental understanding of surprise and deception within operational art concepts. The Soviets illustrate this understanding in their 1980s professional journals when they state "the growth of the significance of the 'information struggle,' having as its goal the steering of the enemy in the directions of one's own plans and intentions."[65] The fusing of theoretical understanding with a modern appreciation of the movement of information on the battlefield, and the related technology, is a seminal moment. No longer was information merely conveyed by actions but now it could also be denied, modified, augmented, or created for a specific purpose.

United States Discussion

"The crises of our time, it becomes increasingly clear, are the necessary impetus for the revolution now under way. And once we understand nature's transformative powers, we see that it is our powerful ally, not a force to feared our subdued."[66]
–Thomas Kuhn

The Post-Vietnam War United States military faced a significant crisis. Having arguably never lost a tactical engagement during the Vietnam War, it was defeated strategically and increasingly the war looked like an operational failure as well. Internal academic discussion in the Army catalyzed a reform movement that doubted the viability of current doctrine to succeed in battle. The debate to change took place in open academic forums ranging from Army Captains to United States Senators.[67] The Army Training and Doctrine Command published three seminal works that define this period in operational art within the United States military.

Published in 1977, 1982, and 1986, the Field Manual 100-5 Operations provided an increasingly revolutionary framework on which the Army based operations.

The first revision of the Field Manual, titled Active Defense was widely viewed as insufficient and was merely the tactical culmination resulting from a post World War II intellectual military deficit emphasizing attrition through technological superiority over warfighting.[68] Army commanders rapidly realized the futility of this doctrine given the sheer scope of the enemy they faced in the Warsaw Pact countries. In their estimation no level of technological superiority could sufficiently attrite the enemy to an extent that would yield success. The next revisions titled Airland Battle introduced revolutionary doctrinal concepts into the Army that philosophically dealt with the quantitative deficit when facing the Soviets and the Warsaw Pact. The Airland battle integrated the Soviet concepts of Deep Battle and Operational Shock coherently and pushed them to new elevations using cognitive coherence tools such as the observe-orient-detect- act loop or the more commonly known OODA loop.[69] The revolutionary cognitive concept was developed from Colonel John Boyd's experience analyzing American and Korean dogfights during the Korean War.[70] Boyd's concept stressed the need to cognitively disrupt the enemy thought process using two methods, by changing the pace and scale of one's own operations, commonly referred to as tempo, and presenting the enemy incomplete or inaccurate information of one's own situation or their own in order to disrupt their decision making process.[71] The coupling of tempo with information manipulation in Airland battle, created previously unprecedented level of integration of information with operational art.

Authors such as Shimon Naveh contend that the Airland Battle doctrine completely eclipsed Soviet Doctrine by integrating revolutionary thought from Boyd: "Moreover, by innovating new operational ideas and terminology, the two civilians [Boyd and Bill Lind]

provided the military reform circle not only with conceptual and linguistic patterns that could

serve as a basis for a new professional cognition, but also with systemic tools of criticism for the

examination of the existing doctrine."[72] The integration of this thought led to coherent doctrine

that was set forth in the 1982 publication and refined in the 1986 publication. The integration of

the OODA loop elevated the elements of information to levels never realized during the Soviet

apex and created broad opportunities for operational commanders to influence the battlefield in

ways never before possible.

Throughout all three publications the elements of information were integrated, though to

varying degrees. The 1977 publication integrated information in the traditional sense

emphasizing the use of deception to enable firepower and attrition warfare.[73] Other than the

traditional integration of information there were not any groundbreaking sections and much like

the publication itself it left much to be desired. Though the 1982 publication was

groundbreaking with its introduction of the Airland Battle, it added little to the academic

discussion regarding the importance of information. It used worn phrases to emphasize the

importance of surprise and deception and cursorily discussed psychological operations without

much discussion of the impact on the battlefield. [74] Despite the fact that the 1986 Field Manual

is largely regarded as a refinement of the 1982 version, it exhibits a significant improvement in

its discussion of operational art, deep battle, and the integration of information.[75] The manual

introduced groundbreaking thought to the United States Military on the power of information

within the operational framework. The authors stayed true to the traditional Soviet model of the

"deep battle" and "operational shock," implementing the concepts by the coordinated application

of combat capabilities. By exploiting Boyd's OODA loop, surprise and deception were

integrated to fight the deep battle along with the traditional elements of maneuver. In essence

the information elements were used as an element of combat power to extend the battlefield and maintain initiative for ground forces.[76] In this manner a commander could create a cognitive situation that the adversary could not understand. When this situation is coupled with high tempo operations, the adversary commander is left with a dated perspective of the battlefield and is vulnerable to deception based upon the psychological impact of surprise and high tempo operations. The two previous seminal publications simply treated these elements as tactical enablers of the attack or the defense.

The publication also addressed the element of psychological operations at the operational level of war. However, unfortunately the discussion of psychological operations centers upon tactics and is overly descriptive of terminology and processes rendering the discussion bland and not useful. This is likely because the doctrine within the psychological operations community was catching up to broader Army doctrine. The introduction of the operational level psychological operations within FM 3-0, demonstrates this gap.[77]

Information as an Element of Combat Power

"Whoever can make and implement his decisions consistently faster gains a tremendous often decisive advantage. Decision making thus becomes a time-competitive process, and timeliness of decisions becomes essential to generating tempo."[78]
-MCDP 1, Warfighting

The current Army FM 3-0, Operations, covers a wide range of operations and is more prescriptive than the 1986 version of the Field Manual. It still holds to some of the philosophical underpinnings but has largely devolved into a descriptive manual of types of the character of operations and how capabilities support operations.[79] The current version of the Marine Corps Doctrinal Publication (MCDP) 1, Warfighting, faithfully adheres to the philosophical descriptions began with the 1982 Field Manual and has only been revised once since its introduction in 1989. Based upon its faithful representation, current relevance, and the fact that

Army doctrinal structure will closely mirror that of the Marine Corps by 2015, MCDP-1 is a relevant foundational document to use for current doctrine.[80] Marine Corps Doctrine discusses the integration of the elements of information within the context of operational art and maneuver warfare extensively. The publication remains consistent with what the Army proposed in the 1986 version of FM 100-5 and acknowledges the operational effects of surprise and deception on the battlefield.

The thoughts of significant military on information within warfare are important. Thinkers such as Lieutenant General Paul Van Riper think information should be an element of combat power when they state "I believe what will reveal itself as we understand operational art is that information is the third element of combat power. Not computer network operations but the fundamental elements of deception and psychological operations."[81] MCDP 1 defines combat power as the "total destructive force we [U.S. Forces] can bring to bear on our enemy at a given time."[82] Whether the importance of information has raised it to a level that allows its designation as an element of combat power alongside maneuver and fires is an important discussion. Joint doctrine and activity concepts provide potential paths that this could materialize. Since the passage of The Goldwater-Nichols Act in 1986, joint doctrine is another driver of how information is viewed within the United States Military. With this in mind, two publications are critical, the first is the Joint Publication 3-0, Joint Operations, intended to define the way in which the joint force fights.[83] The other is the Capstone Concept for Joint Operations Activity Concepts developed by the former Joint Forces Command, and is intended to influence the development of the future force through experimentation and discussion.[84]

Joint Operations primarily focuses on describing the multitude of operations that the joint force might conduct, how the forces are commanded and controlled, and how the various

capabilities available to the joint force commander might be applied while describing operational art and non-linear operations. The publication concludes by describing the principals of joint operations of which it lists surprise as one, adhering to the traditional list used in Army doctrine. The Joint Activity Concept publication proposes four types of joint operations: Joint Combat, Joint Security, Joint Engagement, and Joint Relief and Reconstruction. Of these four concepts, the publication proposes that information is an integral part of joint combat to the point that it is an additional element of combat power along with maneuver and fires. The concept adds information as a part of the disruption and defeat mechanism in the same manner as the Soviet and American operational art concepts. The elements of information enable the joint force to control information in order to surprise an adversary as to its place of attack, influence audiences within and without the battlespace to create an additional dimension to the military operation, and deceive the adversary creating an action in the deep battlefield that further elongates the battlefield.[85]

Additional Research

The elements of information potentially create a significant amount of power on the operational battlefield for the commander. Modern information operations further integrates capabilities such as electronic warfare and cyberspace operations as core elements in addition to the traditional elements defined herein. It would be helpful to research historical campaigns further and understand if the addition of these two elements of adds utility or does it unnecessarily intermingle the elements of information content and information systems. Additionally, this paper discusses how Soviet and American doctrine envisions the integration of information within operational art. Further research on how to conduct integration along the five phases of Joint Operations would also be helpful to give commanders and planners an

appreciation of the time required to effectively surprise, influence, and deceive an adversary at the operational level.

Conclusions

The elements of information have been a part of conflict since its inception to varying degrees based on the level of war and the complexity of the society that was waging it. Though the practice of warfare reflects the significance of information, often times its impact in theoretical writing is hidden within military concepts. From the introduction of Clausewitz, operational art, and the dialogue within the German Army preceding World War I, the potential power of information on the battlefield progressed significantly within military intellectual circles. Although the Soviets promptly began the discourse on operational art concepts following World War I, they did not initially develop the relationship between operational art and information. Only later as the discussion matured, did the Soviets effectively integrate information as a fundamental element within their greatest concepts, "deep battle" and "operational shock." These concepts created a multi-dimensional capability that systemically disrupted a capable adversary and demonstrated huge success on the plains of Central Europe during the 1944 counter-offensive. Following World War II, the integration of information at the operational level followed closely with the integration of operational art as the Soviets focused instead on strategic nuclear capabilities to the detriment of operational art. As the Soviet Union reached a renaissance within operational art in the 1970s and 1980s, information's position within it rose to new levels. This development culminated as the United States, informed by an extensive understanding of cognitive theory in war, integrated operational art and information to new levels in its doctrine aimed at recapturing operational initiative among the world powers.

Despite the fact that the United States once integrated information within operational art to new levels, it has since devolved. Current American doctrine attempts to define all types of conflict and describe how capabilities function within combat as opposed to providing a theoretical basis for operational concepts. Today, the United States military is at a potential crossroads when it considers how it integrates information within military operations and two likely paths exist. It can maintain status quo and continue along a doctrinal path that lacks theoretical operational art underpinnings and with it fails to harness the true power of information. Or, it can take advantage of the modern information proliferation and make the elements of information a central part of operational concepts while reintroducing the theoretical roots of operational art thus providing commanders flexibility, adaptability and effectiveness in the local context.

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[1] Paul van Riper, "Operational Art and its Study," (lecture, Marine Corps University, Quantico, VA, August 8, 2012).

[2] Joint Chiefs of Staff. "Doctrine for the Armed Forces of the United States." *Joint Publication 1* (Washington, DC: Joint Chiefs of Staff, March 25, 2013), I-1.

[3] Joint Chiefs of Staff. "Joint Operations." *Joint Publication 3-0* (Washington, DC: Joint Chiefs of Staff, August 11, 2011), GL-7.

[4] Martin van Creveld discusses the development of operational art and the dependence on command and control processes and tools. Martin van Creveld. "Napolean and the Dawn of Operational Warfare." in *The Evolution of Operational of Operational Art: From Napolean to Present,* ed. by John Andreas Olsen and Martin van Creveld (New York, NY: Oxford University Press, 2011), 9-34.

[5] Echevarria and Glantz extensively discuss the development of operational art within the German and Soviet intellectual military circles. David W. Glantz, *Soviet Operational Art: In Pursuit of Deep Battle* (Great Britain: Frank Cass, 1991), 2-45. And Antulio J. Echevarria II, *After Clausewitz: German Military Thinkers before the Great War* (United States of America: University of Kansas Press, 2000), 2-12.

[6] Carl von Clausewitz, *On War,* ed. Michael Howard and Peter Paret, trans. Michael Howard and Peter Paret (Princeton, NJ: Pricneton University Press, 1984), Kindle Edition.

[7] The Department of Defense defines modern Information Operations as the integrated employment, during military operations, of information related capabilities in concert with other lines of operation, to influence, disrupt, corrupt, or usurp the decision making of adversaries and potential adversaries while protecting our own. Joint Chiefs of Staff, *Information Operations.* Joint Publication 3-13 (Washington, DC: Department of Defense, November 27, 2012), vii.

[8] Commandant of the Marine Corps, *CHANGING THE TERM PSYCHOLOGICAL OPERATIONS TO MILITARY INFORMATION SUPPORT OPERATIONS*, MARADMIN 715/11, December 12, 2011, http://www.marines.mil/News/Messages/MessagesDisplay/tabid/13286/Article/110888/changing-the-term-psychological-operations-to-military-information-support-oper.aspx.

[9] "Formal Beysian Theory of Surprise," University of Southern California Neuroscience Department, accessed 6 January 2013, http://ilab.usc.edu/surprise/.

[10] University of Southern California Neuroscience Department.

[11] Joint Chiefs of Staff, *Department of Defense Dictionary of Military and Associated Terms.* Joint Publication 1-02 (Washington, DC: Department of Defense, December 15, 2012), 190.

[12] Alvin J. Silk, *What is Marketing?* (Cambridge, MA: Harvard Business Press, 2006), 130-138.

[13] Silk, 137-140.

[14] Christopher Paul describes the first use of actively providing enemy soldiers with information in an effort to change their behavior and effect surrender during World War I. Though the act was not termed psychological operations until 1920, this projection of information loosely represents what is acknowledges as psychological operations today. There is some debate however as to the purpose of military bands in years preceding World War I and weather the purpose of the bands, in addition to providing guidance to one's own forces for movement, was to intimidate enemy forces. Because the original purpose of military bands was to synchronize movement this potential earlier manifestation of psychological operations is discounted. Christopher Paul, *Information Operations: Doctrine and Practice* (Westport, CT: Praeger Security International, 2008), 11-13.

[15] Sun Tzu, *The Art of* War, trans. Samuel B. Griffith (United States of America: Oxford University Press, 1963), Kindle edition.

[16] Sun Tzu, Kindle edition.

[17] Joint Chiefs of Staff, *Military Deception*, Joint Publication 3-13.4 (Washington, DC: Department of Defense, January 26, 2012), IV-4.

[18] Joint Chiefs of Staff, Department of Defense Dictionary of Military and Associated Terms, 190.

[19] Carl von Clausewitz, Kindle Edition.

[20] Joint Chiefs of Staff, Military Information Support Operations. Joint Publication 3-13.2 (Washington, DC: Department of Defense, December 20, 2011),VII-1.

[21] James Gleick, *Chaos* (New York, NY: Penguin Books, 1988), 11-21.

[22] Though not yet operational art, the understanding of battle in an open system or a system subject to external influences, created the conditions allowing for the effective integration of information. This understanding coupled with the development of theories that understood modern war was not likely to end in a singular force on force engagement created the conditions for operational art. Echevarria, 10.

[23] Echevarria, 168.

[24] Echevarria, 53

[25] Echevarria, 33-36.

[26] The author describes non-linear systems and the chaos that is associated with the systems. In non-linear systems chaos at the local level that may be associated with *Auftragstaktik* could be represented at the global level as order, dictated by German doctrine. Though the order exists at the global level due to the chaos at the local level the adversary is surprised by the unexpected scenario that the attacking force presents to him. Gleick, 50-56.

[27] Echevarria, 38-42.

[28] Echevarria, 111, 168.

[29] Echevarria, 168, 195-197.

[30] Echevarria, 14.

[31] Echevarria,154-155.

[32] Echevarria, 110-115.

[33] Echevarria, 122-125.

[34] Echevarria, 117.

[35] Carl von Clausewitz, Kindle Edition.

[36] In the introduction to Glantz's book Christopher Donnelly reflects upon the disparity between the Wehrmacht's understanding of the operational level of war and that of the Soviets. He explains how the Wehrmacht strove for tactical excellence and often misunderstood the larger battle and campaign within which they were fighting. The ultimate point is that the tactical superiority of the Wehrmacht is irrelevant because the Soviets effectively deceived large formations to tactically attack into their operational encirclements thus capturing and eliminating large German formations. David Glantz, *Soviet Operational Art: In Pursuit of Deep Battle, (Totowa, NJ: Frank Cass Press, 1991),* xxi.

[37] Following World War I and the two distinctive types of warfare that characterized the Eastern and Western Fronts, two different schools of thought emerged within German military thinking. One school, led by General Ludwig von Beck, sought to take lessons learned on the Eastern front and apply them at the operational level of war.[37] The competing school of thought became known as *blitzkrieg*. *Blitzkrieg* developed from a school that witnessed the tactical excellence of the German soldier during World War I and attempted to derive an operational theory from the excellence. However, *blitzkrieg* continued to emphasize tactical excellence above strategy and failed to function at the operational level of war and account for strategy let alone connect strategy to tactics.[37] Unfortunately for Germany, this school was adopted by Adolf Hitler.   Under the direction of Hitler, the Reichswahr discarded Beck's theory leading to events that eliminated his influence in 1938. The focus on tactical excellence above all other priorities led to the demise of operational thought within the Reichswahr and thus an understanding of the operational level of war along with the impact of information in an operational context. Naveh, 118.

[38] Van Creveld, 65-75.

[39] David Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 1.

[40] Union of Soviet Socialist Republics, *Dictionary of Basic Military Terms*, trans. United States Air Force (Moscow, RS: USSR, 1965), 225-229.

[41] David Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 1.

[42] Naveh, 217-221.

[43] Schwerpunkt is the Clauswitzian concept of center of gravity. Naveh, 47.

[44] The Soviets integrated the concepts of physical attack or a strike with cognitive attack, surprise and deception, to create momentum against the adversary center of gravity. This combination eliminated the need to conduct attrition warfare as adversary forces were paralyzed and unable to fight because of a loss of effective command and control as well as ignorance about what the nature of the battle was. Naveh 218-219.

[45] Naveh, 219.

[46] Naveh, 88.

[47] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 92.

[48] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 101-148.

[49] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 127-129.

[50] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 150.

[51] David Glantz, *Soviet Military Deception in the Second World War* (Totowa, NJ: Frank Crass Press, 1989), 293.

[52] Glantz, *Soviet Military Deception in the Second World War*, 294.

[53] Glantz, *Soviet Military Deception in the Second World War*, 292 – 348.

[54] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 160-163.

[55] Olsen, 87-88.

[56] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 177-178.

[57] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 177.

[58] Van Creveld, 88.

[59] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 158.

[60] Olsen 88-90.

[61] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 158, 221.

[62] Van Creveld, 88.

[63] Van Creveld, 88.

[64] Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 208.

[65] Glantz extracts this quote from a 1986 professional Soviet journal on the conduct of land warfare and the implications of technological change on future warfare. The fundamental statement reflects what the United States currently terms as deception and aligns with doctrine, causing an enemy decision maker to act in a manner of our choosing. Glantz, Soviet Operational Art: In Pursuit of Deep Battle, 256.

[66] Thomas Kuhn, *The Structure of Scientific Revolutions, (Chicago, Ill: University of Chicago Press, 1970), .*

[67] Jeffrey Long discusses how the Army debated the futility of the "Active Defense" in the Military Review Journal. The debate took place between Captains and General Officers and invigorated Congress to act and join in the debate to the point that Senator Gary Heart became involved. The underpinnings of Airland Battle were truly at the grassroots. Jeffrey W. Long, "The Evolution of U.S. Army Doctrine: From Active Defense to Airland Battle and Beyond," (master's Thesis, U.S. Army Command and General Staff College, 1991), 181-185. Naveh, 11.

[68] Naveh, 254-255.

[69] Olsen, 155.

[70] Robert Coram. *Boyd: The Fighter Pilot Who Changed the Art of War*. (New York: Little, Brown, and company, 2002), 201. Frans Osinga, *Science, Strategy, and War: the strategic theory of John Boyd,* (New York, NY: Routledge, 2007), 235.

[71] Osinga, 236-237.

[72] Naveh, 262.

[73] Headquarters Department of the Army, *Operations*, Field Manual 100-5 (Washington D.C.; U.S. Army, 29 December 1977), 36.

[74] Headquarters Department of the Army, *Operations*, Field Manual 100-5 (Washington D.C.; U.S. Army, 20 August, 1982), 19.

[75] Naveh, 304-313.

[76] Headquarters Department of the Army, *Operations*, Field Manual 100-5 (Washington D.C.; U.S. Army, 5 May, 1986), 20, 27, 53.

[77] The 1982 version of the Field Manual only discusses tactical and strategic Psychological Operations while the 1986 version introduces Operational level Psychological Operations and does not expound upon the delineations well. Headquarters Department of the Army, 1982 and Headquarters Department of the Army 1986.

[78] Headquarters U.S. Marine Corps, Warfighting, MCDP 1(Washington, DC: U.S Marine Corps, 20 June, 1997), 85.

[79] Headquarters Department of the Army, *Operations*, Field Manual 3-0 (Washington D.C.; U.S. Army, 22 February, 2011), 49-98.

[80] Clinton J. Ancker and Michael A. Scully, "Army Doctrine Publication 3-0: An Opportunity to Meet Challenges of the Future," *Military Review* (January-February 2013): 38-42.

[81] Van Riper.

[82] Headquarters U.S. Marine Corps, W*arfighting*, MCDP 1(Washington, DC: U.S Marine Corps, 20 June, 1997), 39.

[83] Whereas the Army created the 1982 concepts from FM 100-5 internally, in the modern United States Military Joint Publication 3-0 and the Joint Activity Concepts should drive how the services fight within the Joint Force. Joint Chiefs of Staff, *Joint Operations,* Joint Publication 3-0 (Washington, DC: Joint Chiefs of Staff, 11 August 2011), 11.

[84] John Schmitt (Author of MCDP 1 and Joint Activity Concepts), E-Maile exhange, in discussion with the author, October 2012

[85] The Joint Activity Concept goes to great length to describe the proliferation of information dissemination on the battlefield to justify the addition of information to the elements of combat power. The publication acknowledges that based upon the proliferation elements such as surprise and deception have grown in complexity due to adversaries access to information and thus take a greater position for the commander's attention in order to be successful. Further the publication describes the competition for the attention of those that the Joint Force would like to influence and thus the increased importance of information in order to influence broader target audiences. All of the increase in importance of information is under the assumption that the United States is a benevolent power that must ensure actions taking place on the battlefield reflect the truth so it can maintain credibility. Joint Chiefs of Staff, Joint Activity Concepts, 19-54.

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